LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

POVERTY POINT RESERVOIR

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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TABLE OF CONTENTS

WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Largemouth bass are currently being managed to provide anglers the greatest opportunity of catching trophy size fish. The potential should be high, as this is a new, fertile reservoir with abundant forage and a high percentage of Florida-strain bass present. Poverty Point was designated as a trophy lake in 2004. The trophy lake designation implies management techniques are being applied to produce largemouth bass in the 10 – 15 pound range. Recreational harvest restrictions for largemouth bass include a 15" – 19" slot limit with an 8 fish creel. Anglers are allowed to harvest only 1 bass larger than 19" in length. Required criteria for successful trophy bass management include:

1. Successful introduction of Florida-strain largemouth bass.
2. Habitat with similar environmental features as original range of the Florida largemouth bass
3. No incompatible gear conflicts
4. Long term LDWF regulatory control
5. Angler understanding and support of associated regulations
6. Harvest of smaller bass to increase available forage for remaining fish.

Sunfish and other species are managed under the maximum sustained yield scheme, which results in abundant fish for anglers and forage for bass. This can normally be achieved through proper bass management and usually won't require any other species-specific regulations. The crappie creel limit has been reduced to 25 due to concern of excessive exploitation.

Commercial

No commercial fishing gears are allowed on the lake.

Species of Special Concern

No threatened or endangered fish species are known to exist in the lake.

EXISTING HARVEST REGULATIONS

Recreational

Crappie (*Pomoxis spp.)* - 25 daily per person, no size restriction

*Sunfish (*Bluegill *Lepomis macrochirus,* Redear *L. microlophus,* etc.*)* – no daily limit or size restriction

Largemouth Bass (*Micropterus salmoides)* – 15" – 19" slot limit (all bass measuring 15.0" to 19.0" must be released immediately), 8 fish daily limit, only 1 may exceed 19"

Yellow Bass (Morone mississippiensis) and *White Bass (M. chrysops)*– 50 daily per person, no size restriction

Channel Catfish (Ictalurus furcatus) – 100 daily per person, 11" minimum length (25 fish

below the minimum length may be harvested)

The 2013 recreational fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

Commercial
Commercial fish netting is prohibited.

The 2013 commercial fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

Species of Special Concern
None

SPECIES EVALUATION

Recreational

Largemouth Bass

Catch per Unit Effort and Length Frequency-
Electrofishing is the standard sampling method used to estimate various parameters of the largemouth bass population. Standardization of sampling and analysis of numerous samples performed over a long period of time are necessary for accurate estimates of fish populations. Largemouth bass are targeted as a species indicative of the overall fish population due to their high position in the food chain. Electrofishing is the selected method for determining largemouth bass abundance and size distribution. Electrofishing is not an efficient sampling technique for large bass. Gill nets are used to provide sampling data for large bass. In the chart below (Figure 1), bass abundance for different size classes is indicated by electrofishing catch rate. Catch per unit effort (CPUE) in this case is defined as the number of bass collected during 1 hour of sampling time.

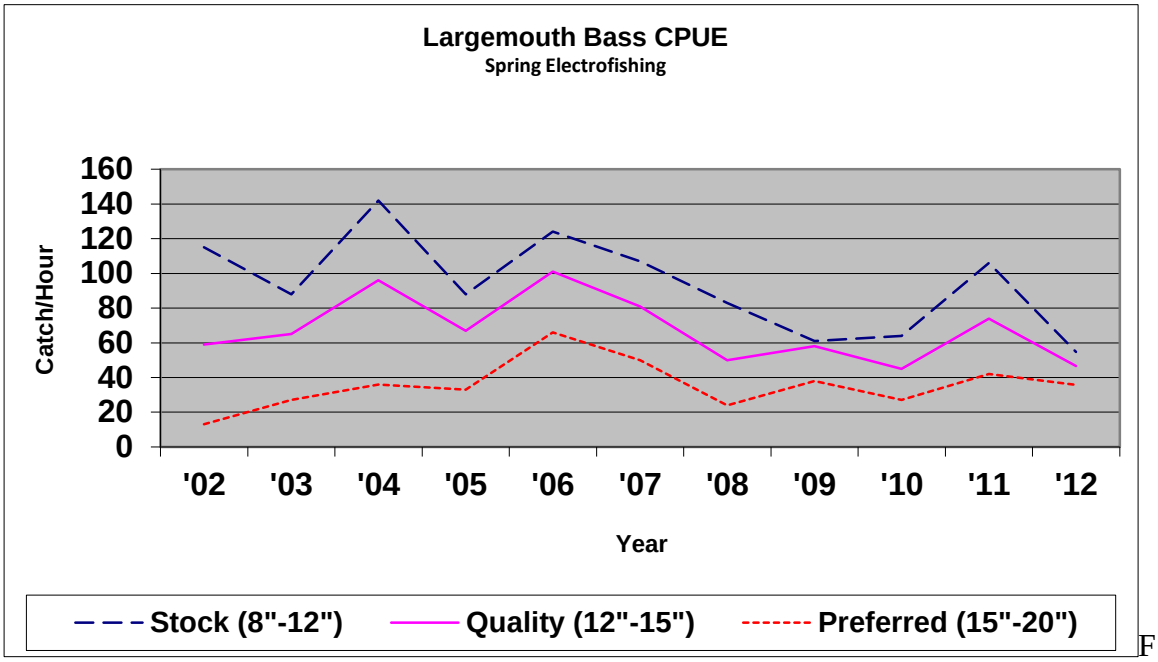

Figure 1. The catch per unit effort of largemouth bass by size class from spring electrofishing results on Poverty Point Reservoir, LA, 2002 – 2012.

The above chart depicts what would normally be expected from a new reservoir with an expanding fish population: abundant small fish, with increasing numbers of larger fish over subsequent years. Year to year differences have little significance, but the longer term trends show that the population has become well established and appears properly balanced.

The following size distribution charts (Figure 2) show how the bass population has become more stabilized since the opening of the lake. In 2002, small fish dominated the population. The 2003 sample shows a fairly well distributed population before angling has had an effect. The number of large bass over 16 inches has steadily increased, while recruitment of smaller fish appears to be sufficient.

Largemouth Bass Size Distribution (Inch groups) Charts for Years 2002 – 2008.

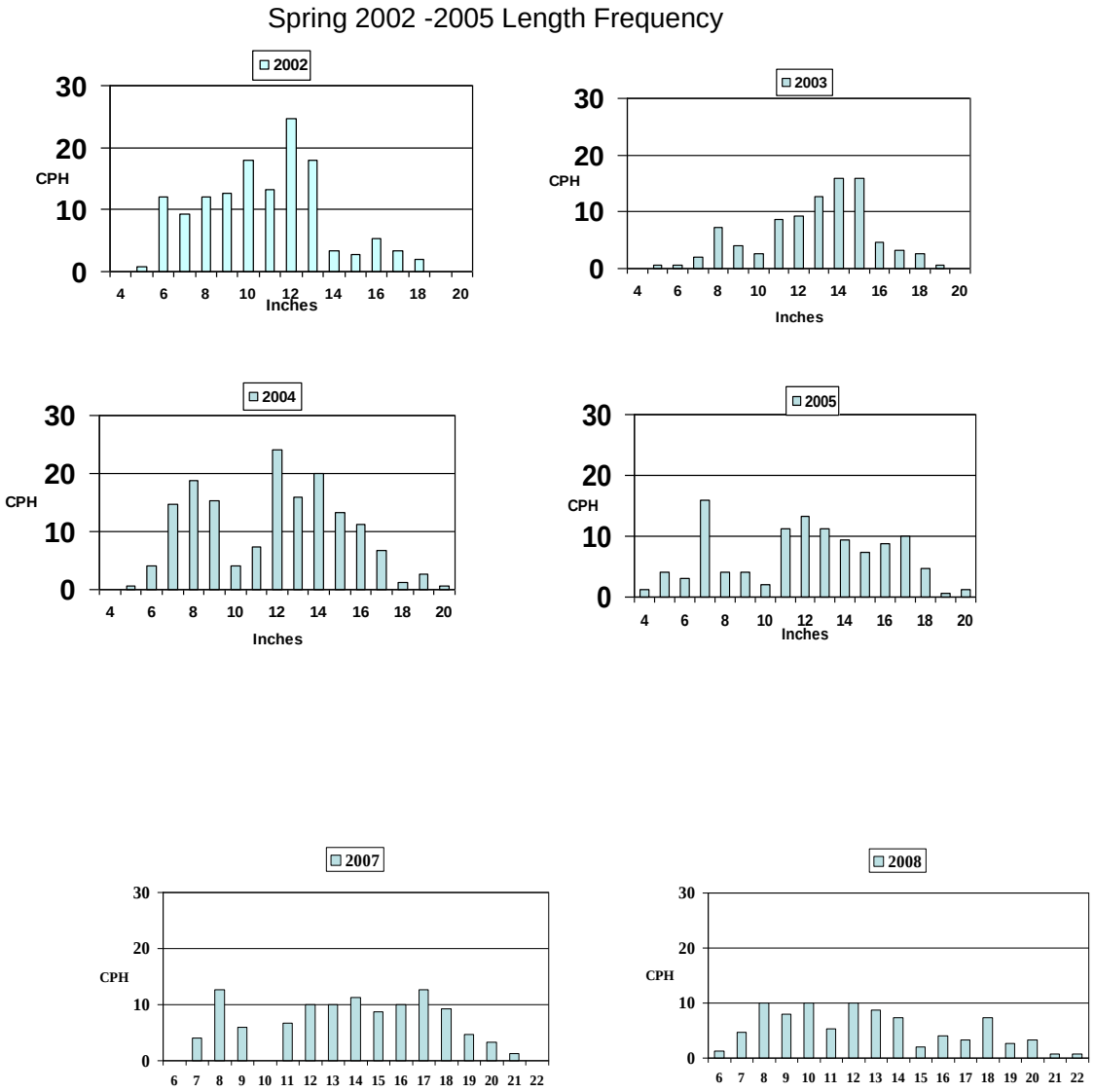

Figure 2. The largemouth bass size distributions (inch groups) from spring electrofishing results on Poverty Point Reservoir, LA, for years ’02, ’03, ’04, ’05, ‘07, and ’08.

The latest (2012) size distribution (inch groups) of the largemouth bass population is shown below (Figure 3). The population appears to be normally distributed, with most inch groups represented. The actual distribution may be skewed towards larger size fish, considering that electrofishing typically does not effectively sample that portion of bass population.

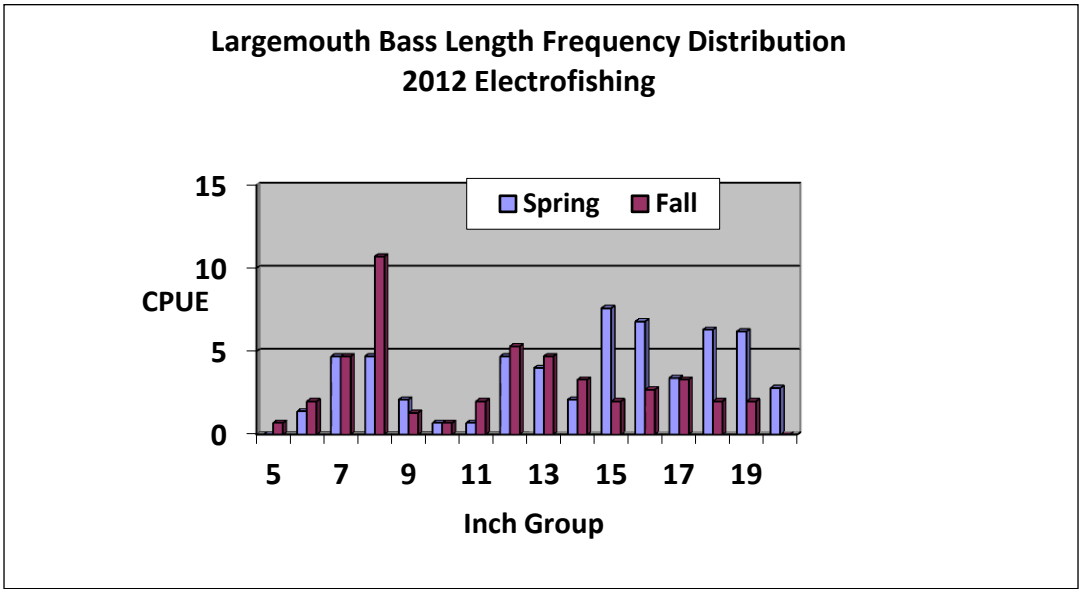

Figure 3. Largemouth bass length frequency distribution from spring (n=90) and fall (n=71) electrofishing on Poverty Point Reservoir, LA, 2012.

Stock Density

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data. Proportional stock density compares the number of fish of quality size (greater than 12 inches for largemouth bass) to the number of bass of stock size (>8 inches in length). The PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. Values for PSD, $RSD_{preferred\ (15"\ and\ greater)}$, and $RSD_{memorable\ (20"\ and\ greater)}$ are shown in the table below (Table 1). Fish exceeding 20 inches in length began showing up in 2005 samples. Ideal PSD and RSD values for largemouth bass range from 40-70 and 10-40.

Table 1. Largemouth bass stock density values from spring and fall electrofishing on Poverty Point Reservoir, LA from 2002 – 2012.

Sample Date	PSD	RSD_p	RSD_m
Spring 2002	51	12	0
Fall 2002	27	5	0
Spring 2003	74	18	1
Fall 2003	50	31	0
Spring 2004	68	25	0
Fall 2004	37	11	0
Spring 2005	76	37	2
Fall 2005	57	24	2
Spring 2006	82	53	3
Fall 2006	51	27	2
Spring 2007	76	47	4
Fall 2007	45	22	4
Spring 2008	60	29	6

Fall 2008	65	35	3
Spring 2009	96	63	-
Fall 2009	52	23	-
Spring 2010	70	42	-
Fall 2010	59	30	-
Spring 2011	70	40	-
Fall 2011	84	50	-
Spring 2012	85	65	-
Fall 2012	63	30	-

The following graph (Figure 4) shows compares the PSD and $RSD_{preferred}$ for largemouth bass sampled by electrofishing from 2002 through 2012. Both values were a little high in 2006, but have since fallen into the ideal range. Recent values have been in the upper range of what is considered desirable. A possible explanation for the high values is that the lack of shoreline cover at some sample locations in Poverty Point is not attractive to smaller bass, thus underestimating their abundance. The slot limit, which protects bass between 15 and 19 inches, may also be affecting the size distribution of the population.

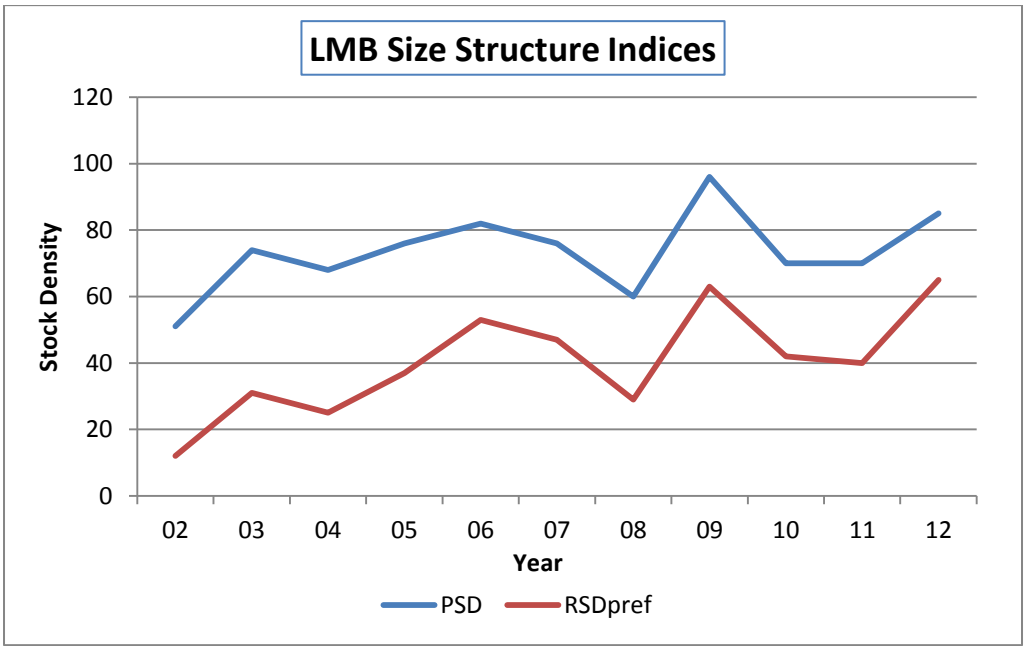

Figure 4. Size structure indices (proportional stock density and relative stock density) values for largemouth bass from Poverty Point Reservoir, LA for spring electrofishing, 2002 –2012.

Age and Growth

The following graph (Figure 5) shows length at age of capture for largemouth bass from 2005 and 2008 fall collections. Largemouth bass in Poverty Point have grown at a very rapid rate, which is to be expected in a new reservoir located in the fertile Mississippi Alluvial Valley. Age, growth and mortality results collected during the 2010 – 2012 mortality study are not yet available.

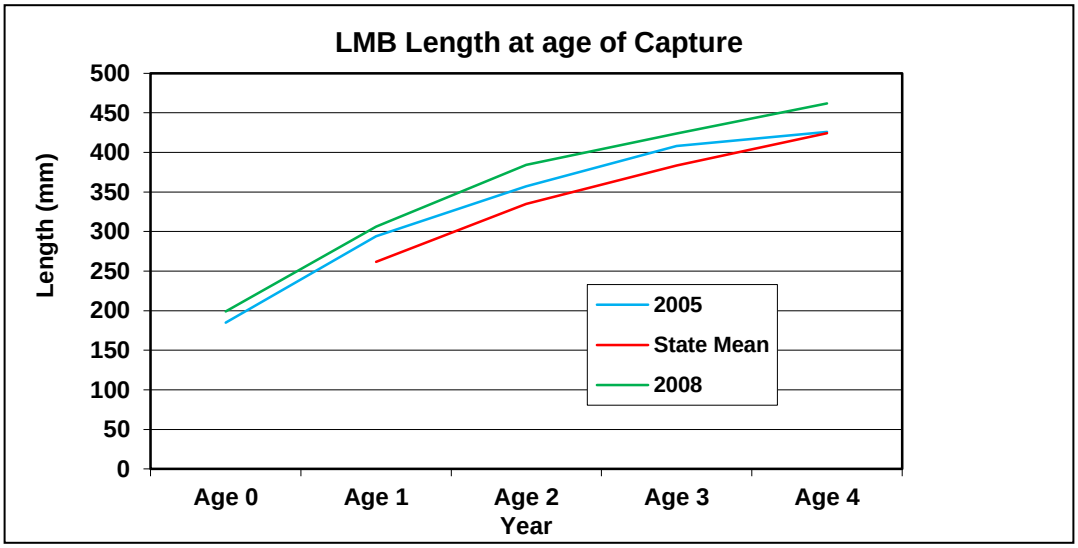

Figure 5. The length at age of capture for largemouth bass from fall electrofishing on Poverty point Reservoir, LA in 2005 (n=76) and 2008 (n=88).

Genetics

Genetic samples taken in 20089 shows that 58% of the bass population is being influenced by Florida strain genomes (Table 2). Stocking programs are considered successful when over 30% of the bass population contains these genetics. LDWF sampling and stocking efforts will be conducted to monitor and maintain a target level of 30% Florida influence in Poverty Point largemouth bass. Results of genetic analysis taken during the 3-year age, growth and mortality study (2010 – 2012) is not yet available.

Table 2. Summary of genetic sampling conducted on largemouth bass from Poverty Point Reservoir, LA from 2001 – 2009.

LARGEMOUTH BASS GENETICS					
Year	N	NLMB	FLMB	NLMB x FLMB	Total FLMB
2001	100	77%	22%	1%	23%
2003	161	73%	7%	20%	27%
2004	117	68%	10%	22%	32%
2005	76	52%	16%	32%	48%
2008	102	44%	25%	31%	56%
2009	74	42%	17.5%	40.5%	58%

Mortality Study

A three-year mortality study on largemouth bass was initiated in 2010. The study involved intensive sampling in spring and fall, and included genetics and age and growth analyses. A recreational creel survey was completed in 2012 to assess angler fishing mortality on the bass population. Information from the growth and mortality results of this project will be used to

assist in the management of largemouth bass in Poverty Point. Results of the study are expected to be completed during 2013.

Forage

Forage availability is measured through shoreline haul seine sampling and indirectly through measurement of largemouth bass body condition or relative weight. Relative weight (Wr) is the ratio of a fish's weight to the weight of a ''standard'' fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. Low largemouth bass relative weights (<80) indicate a potential problem with forage availability.

In Poverty Point Reservoir, sunfish and shad are the primary largemouth bass forage. These fish are very abundant and benefit from the high natural fertility of the reservoir. Relative weights for various size groups are given below (Figure 6) for years 2002 – 2008. To avoid bias from variation as a result of spawning, samples were collected in the fall. The majority of the weights exceed 100%, indicating sufficient forage in Poverty Point Reservoir. Relative weights have been exceptional for the most part with nearly all size fish exceeding 100% Wr in the fall. Relative weights from samples taken in 2012 were no exception, with Wr values of 113, 105, and 121 for stock-, quality-, and preferred-size bass, respectively.

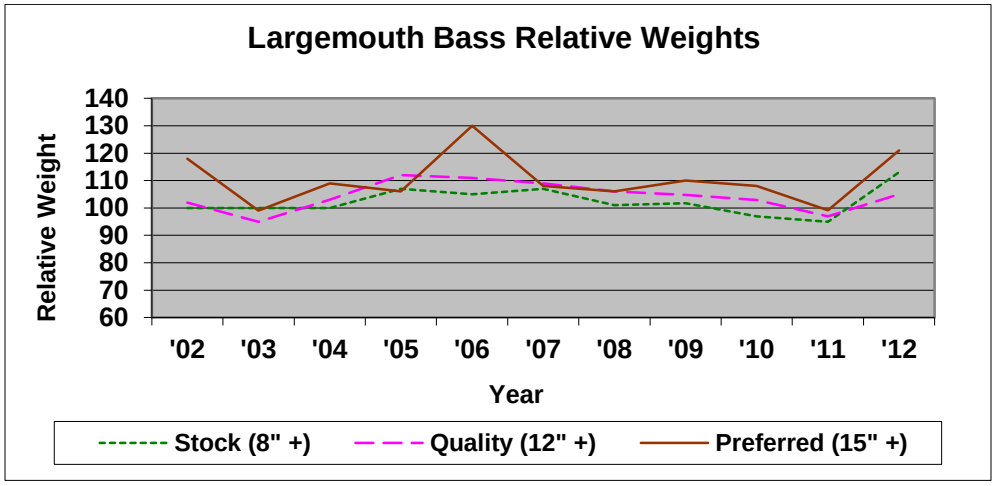

Figure 6. Relative weights for three size classes of largemouth bass from fall electrofishing on Poverty Point Reservoir, LA, 2002 – 2008.

Crappie

*C*rappies have been sampled in Poverty Point with the use of lead nets. Both black and white crappie are found in the reservoir. Black crappies were the dominant species just after the reservoir filled, but white crappies have become more abundant since 2004, now comprising over 90% of the crappie population. The following chart (Figure 7) shows size distribution (length) of black and white crappie for all inch groups in 2004. The CPUE is the sum of 4 different mesh sized nets fished simultaneously, given in total catch per hour. The gill net mesh sizes were 0.5", 1.0", 1.5", and 2.0" measured knot to knot.* This data was collected during 2004 sampling.

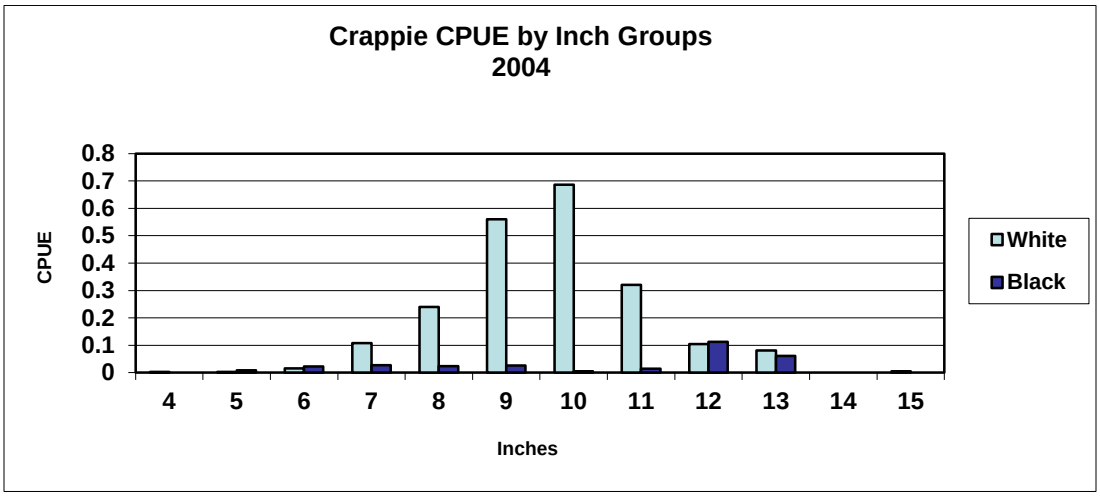

Figure 7. Size distribution in inch groups of the crappie population from Poverty Point Reservoir, LA, results estimated from lead net sampling in Fall 2004 (n=279).

The above chart shows a normally distributed population of white crappie and a few mostly large black crappies. Reproduction of black crappie seems to be impaired as very few small fish were captured. The few large fish probably represent the original population of black crappie that was introduced into the lake during impoundment. The physical characteristics of the lake are probably more suitable to the white crappie as they can endure turbid conditions better than black crappie.

Charts depicting size distribution (inch groups) for both black and white crappie in 2006 (Figure 8) and 2008 (Figure 9) are shown below. These fish were collected in 1.0 inch lead nets only.

*the experimental nets of 0.5, 1.5, and 2.0 inch were also used in 2006 and the data is available.

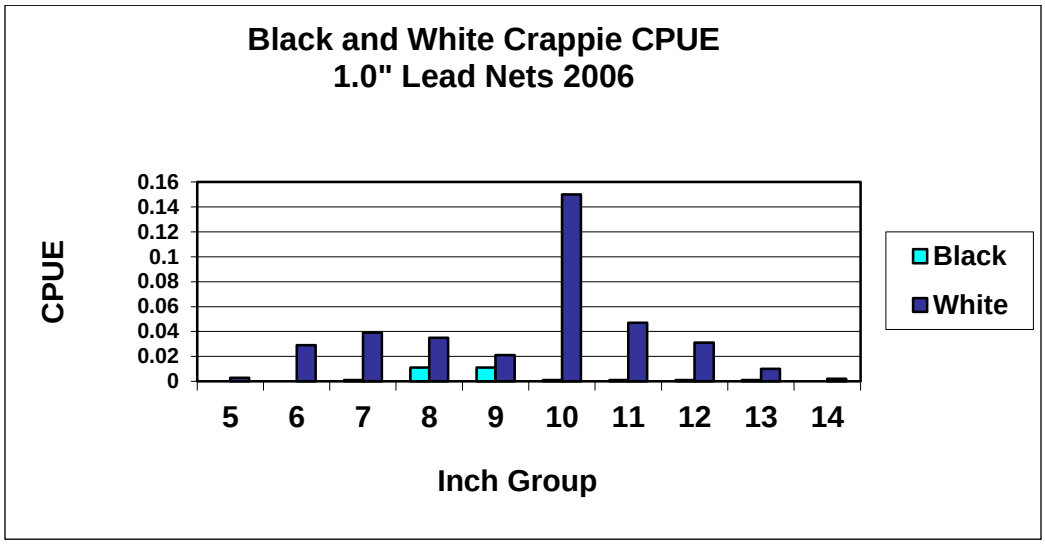

Figure 8. Size distribution in inch groups of the crappie population from Poverty Point Reservoir, LA, results estimated from lead net sampling in Fall 2006 (n=500).

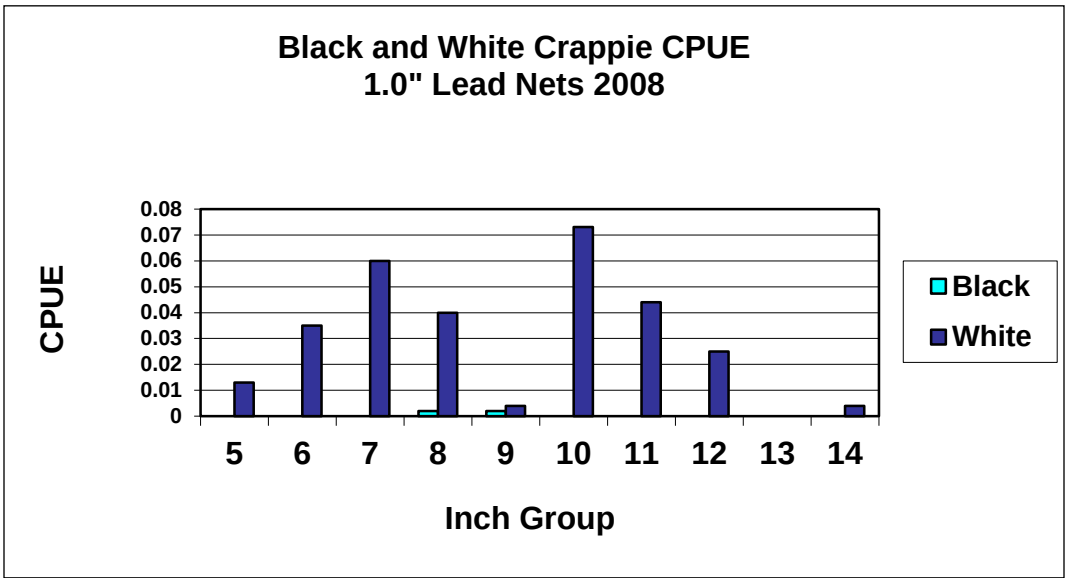

Figure 9. Size distribution in inch groups of crappie from Poverty Point Reservoir, LA, results estimated from lead net sampling conducted in Fall, 2008 (n=154).

The CPUE was lower in 2008 for all sizes of crappie, although the distribution of the population among size classes appears normal. Only a very small number of 8 and 9 inch black crappie showed up in both samples.

Sampling conducted in 2012 with 1.0 inch lead nets revealed a healthy and balanced crappie population, comprised mostly of white crappie. Nearly all inch groups were represented in the size distribution (Figure 10) of the population sample. The bimodal distribution may be the result of only two age classes dominating the population or excessive mortality of mid-size fish. The PSD and $RSD_{preferred}$ values of 40 and 67, respectively, are considered desirable.

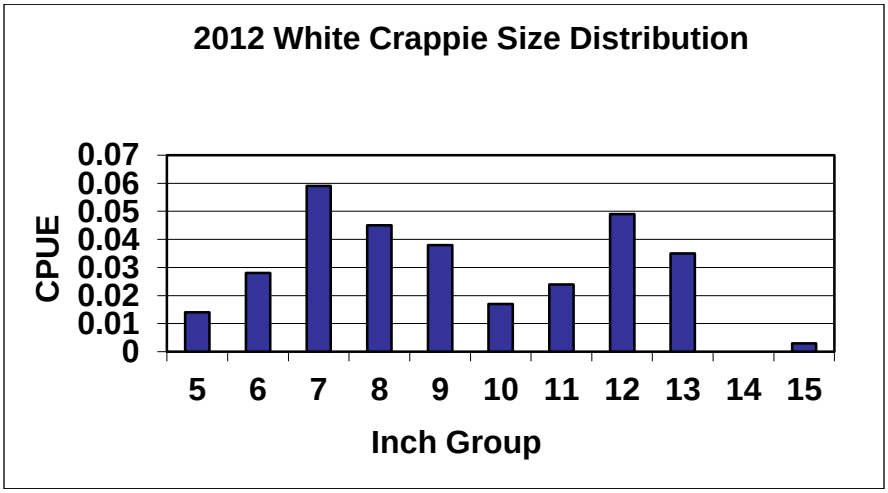

Figure 10. Size distribution in inch groups of white crappie from Poverty Point Reservoir, LA, results estimated from lead net (1.0 in. mesh) sampling conducted in Fall, 2012 (n=90).

2009 Crappie Exploitation Study

In 2009, LDWF conducted at tag-return study to determine the rate of angler harvest on crappie in Poverty Point Reservoir. The study was initiated because of continued angler concern of excessive harvest and to get an accurate estimate of angler-induced mortality on the crappie population. A total of 243 crappie were tagged in early 2009 and 135 tags were returned by anglers by May 31. Exploitation was estimated at 59.3%, assuming a 10% non-reporting rate and no mortality. The abstract of this study, which was published in the 2011 Proceedings of the Southeastern Association of Fish and Wildlife Agencies Conference, is attached in **Appendix I**.

*Channel Catfis*h

Over 75,000 Channel Catfish were stocked into the lake on different occasions in 2003 and 2004. Many of these original fish quickly reached large sizes, with several exceeding 10 lbs. being captured during sampling. The catfish soon began reproducing and have become very abundant in the lake. Lead nets have proven to be an efficient tool for capturing and assessing the channel catfish population. The following chart (Figure 11) shows a size distribution of channel catfish captured during lead net (1.0 in.) sampling in 2012. The values given are the total number of catfish caught in 288 net-hours of lead net sampling. The current channel catfish population has an abundance of desirable-size fish.

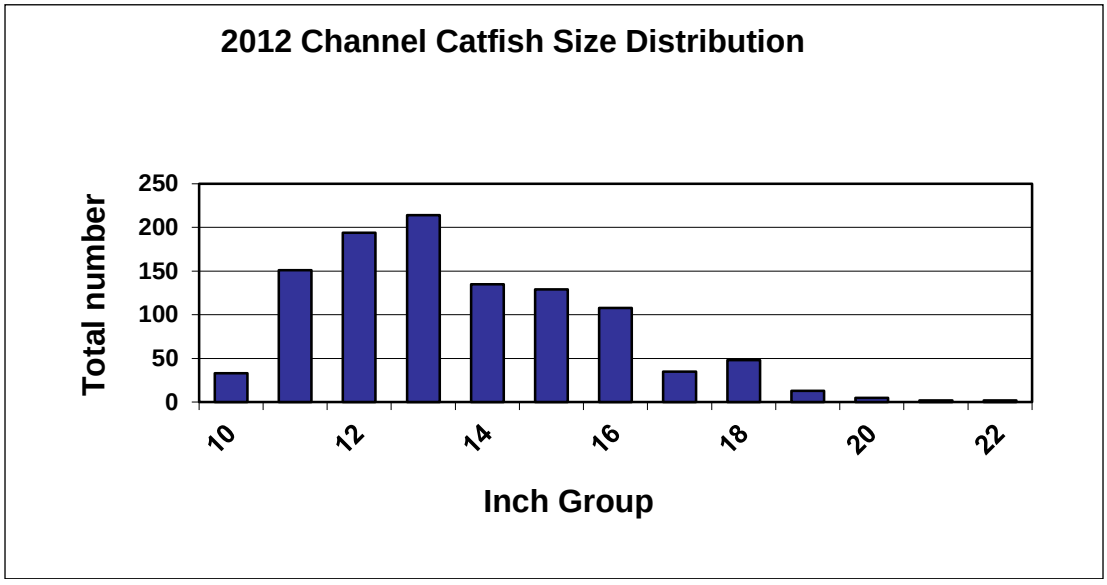

Figure 11. The size distribution (inch groups) of channel catfish captured in lead nets on Poverty Point Reservoir, LA for 2012 (n=1,069).

Commercial - none
Though there are an abundance of commercial species in Poverty Point Reservoir, no commercial fishing is allowed. Species documented during sampling include common carp *Cyprinus carpio*, channel catfish, buffalo *Ictiobus sp.*, and freshwater drum *Aplodinotus grunniens*.

Species of Special Concern - none

CREEL SURVEYS

Self-Clearing Creel (Sept. '03 – March '04)
Each vehicle entering the State Park was given a questionnaire to be filled out upon completion of fishing trip. *Details of this survey are given in Part A of the Poverty Point Management Plan*. Information from 585 trips was obtained. The average number of anglers per trip was 1.7. The following Table 3 shows monthly summaries for number of trips and fish caught.

Table 3. The number of fishing trips and fish caught and harvested by month on Poverty Point Reservoir, LA for 2003 – 2004.

Month	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	Total
Total Trips	87	29	26	73	220	104	46	585
Bass Trips	35	15	0	0	0	7	11	68
Bass Caught	141	60	3	16	1	24	75	320
Crappie Trips	32	14	24	71	217	97	35	490
Crappie Harvested	114	143	289	1,807	4,171	1,321	376	8,221

Nearly 50% of the bass caught were in the slot limit and released. In the months of September, October, February, and March, 21% to 38% of the largemouth bass caught were of legal harvest size and released. The bass angling effort was very low in the other months, whereas crappie angling was very popular. Crappie anglers averaged 9.6, 15.2, 11.1, and 8.7 crappie per trip respectively, from November to February.

Recreational Angler Creel 2005
A non-uniform, random access-point creel survey was conducted throughout 2005 at the south and north boat ramps. The survey was designed to provide monthly estimates of catch, harvest, and release by species. Six surveys were conducted each month, with the length of the survey period being 5 hours. Surveys were done in both the morning and afternoon with morning surveys beginning 2 hours after sunrise and afternoon surveys beginning 4 hours before sunset. Anglers were asked the following questions: duration of trip, species fished for, how many kept and released, how far they drove, and opinion of current fish regulations on Poverty Point. A minimum of 10 fish of each species kept were measured to total length (bass, crappie), or inch group (all others). A total of 423 interviews were completed throughout the creel period. Results of this survey will be available in 2013.

Recreational Angler Creel 2008

The 2008 survey was done identically to the 2005 survey except that only 3 surveys per month were conducted in the months of August to December instead of 6. A total of 377 interviews were conducted on 53 survey days. There was an estimated 27,755 angler hours (10.2 hrs. /acre). Anglers fishing for bass caught 0.7 bass/hr. for an estimated total of 21,365 with 7,389 being released. Anglers fishing for crappie comprised 57% of the total interviews and spent 15,080 hours fishing for crappie. They harvested an estimated 14,779 crappies or 0.76/hr. Bluegill and channel catfish were also harvested frequently by anglers.

Crappie Study Creel 2009

A creel survey in conjunction with the crappie exploitation study was conducted in similar fashion to the standardized creel surveys previously conducted on Poverty Point, with the exception that no surveys were conducted June – September due to the low amount of crappie angling during this period. A total of 348 interviews of crappie angling parties were conducted in 48 surveys. Crappie anglers comprised 67% of all angling parties. There were an estimated 23,866 angler hours directed toward crappie (21.8 hrs./ha or 9.1 hrs./ac). Anglers harvested an average of 6.3 crappie per trip or 1.33 per hour which expanded to a total of 30,462 crappie during the creel period. Only 3% of anglers had harvested the legal limit of 25 crappie/day and the mean length of harvested crappie was 290 mm (11.4 in.). The survey also revealed that 89% of crappie anglers were satisfied with the current crappie regulations on Poverty Point.

Mortality Study Creel Survey 2012

This creel survey was a necessary component of the 3-year mortality study, being used to assess the angling mortality component of the fisheries. Results are not yet available.

HABITAT EVALUATION

Aquatic Vegetation

Submerged vegetation is primarily limited to pondweed (*Potamogeton sp.)* along the shoreline. Even though there is much shallow water in the reservoir, the high turbidity (visibility less than 14 inches) prevents excessive growth of submersed species. Emerged species include water pennywort (*Hydrocotyle umbellata*), and water primrose (*Ludwigia repens*). Water hyacinth (*Eichhornia crassipes*) has also appeared on the lake in small patches but has been controlled with herbicide applications. All vegetation in Poverty Point Reservoir is restricted to shallow shoreline areas. Hydrilla (*Hydrilla verticillata*) was first observed in a cove near the northeast corner of the lake in 2006. It was successfully treated with granular endothall and has not been observed elsewhere in the lake.

Recent vegetation control has involved herbicide application on floating and emergent species in a few shallow protected coves around the lake. In 2009, a total of 52 acres were treated [water hyacinth = 42, alligator weed (*Alternanthera philoxeroides*) = 10]. No herbicide applications were necessary in 2010 and 2011. A total of 31 acres were treated (alligator weed = 20, primrose = 6, pennywort = 5) in 2012. These species have typically been treated with 2,4-D (0.5 gal/acre) and/or glyphosate (0.75 gal/acre) when a waiver is

required (Mar. 15 – Sept. 15). Imazapyr (0.5 gal/acre) has become the primary herbicide for alligator weed control in undeveloped areas. Near homes and developed shorelines, imazamox (0.5 gal/acre) is used because it is not harmful to non-target species.

Substrate

Prior to impoundment, the topsoil was removed from the lake bottom, leaving a soil high in clay content. Much of the lake bottom should be suitable for the spawning of nest building fish, including bass and sunfish. The substrate will become softer over time and less suitable for spawning. Prior to impoundment, nine sand beds were placed in protected locations to provide adequate spawning substrate in the future. The sand beds were recommended to be around 4,000 ft^2 in size.

Artificial Structure

Prior to impoundment, approximately 50 large piles of woody debris were constructed throughout the lake bottom prior to impoundment. They were covered in dirt in such a way to prevent floating. These structures serve as the major offshore fish habitats, especially in the open main lake area. The tops of many of the piles can be seen sticking up slightly above the surface, but the majority must be located with the use of sonar and/or a global positioning system.

CONDITION IMBALANCE / PROBLEM

Common carp, bullhead catfish, and buffalo have become very abundant in the lake, this being determined through observations and gill netting. The invasive carp have a reputation for lowering water quality and destroying spawning habitat of game species. Bullheads feed on a multitude of prey items and compete with more desirable species. Buffalo can destroy nests of game fish and may also contribute to lake turbidity. The impact of these species is not known yet but could potentially be detrimental to populations of other species.

CORRECTIVE ACTION NEEDED

There are no practical means of eradicating the above mentioned species from the lake. Removal of overabundant commercial fish may be necessary in the future.

RECOMMENDATIONS

1. Continue scheduled standardized sampling.

2. Continue stocking of Florida largemouth bass to maintain at least 30% Florida genetic influence as indicated by LDWF sampling.

3. Utilize results of the recently completed mortality studies conducted on largemouth bass and crappie to determine if current regulations are achieving fisheries goals.

4. Plan annual meetings with Poverty Point State Park staff and the Poverty Point Reservoir District to present sampling results and discuss management.

5. Continue efforts for an artificial reef project with Reservoir District.

6. Treat nuisance floating and emergent vegetation as needed. Emergent species should be treated with glyphosate (0.75 gal/acre) or diquat (0.75 gal/acre). Water hyacinth should be treated when observed by spray crews. It should be treated with 2,4-D (0.5 gal/acre) when outside of the waiver period (Mar. 15 – Sept. 15) and with glyphosate (0.75 gal/acre) during this period. Alligator weed should be controlled with imazapyr (0.5 gal/acre) in undeveloped areas and imazamox (0.5 gal/acre) near homes and developed shorelines.

APPENDIX I:

(return to Crappie Study)

Abstract of Crappie Exploitation Study

An Analysis of Exploitation and Harvest of White Crappie in Poverty Point Reservoir, Louisiana
Ryan S. Daniel, Louisiana Department of Wildlife and Fisheries, Inland Fisheries Division, 368 CenturyLink Dr., Monroe, LA 71203.

Abstract
Because of growing angler concern regarding excessive crappie (Pomoxis spp.) harvest in Poverty Point Reservoir, Louisiana, we estimated exploitation rate of white crappie (*P.* annularis) from 1 January – 31 May, 2009, and gathered data on angler characteristics throughout the year at this relatively new reservoir. A reward-tag approach was utilized to assess exploitation, while angler characteristics were determined through a stratified, random, access-point creel survey. White crappie (N=243) were tagged from January – March 2009 with Floy T-bar anchor tags labeled with REWARD and a sequential tag number. A total of 135 tagged crappie were harvested and reported by anglers by May 31, 2009. Exploitation was estimated at 59.3% based on the assumption of a 10% non-reporting rate and no mortality, but could have exceeded 70% if tagging mortality or non-reporting were higher than estimated. The creel survey revealed that crappie anglers harvested 1.33 crappie per hour, with an average total length of 290 mm. Angler effort for crappie was estimated at 21.8 hrs/ha within the eight-month creel period. Fishing mortality and harvest data obtained from this study will supplement future age and growth data to obtain an accurate assessment of total annual mortality, and be utilized in simulations to model the effects of various harvest regulations on the crappie population in Poverty Point Reservoir. This study will also be used as a model in the investigation of specialized crappie management in Louisiana.

Daniel, R.S., 2011. An Analysis of Exploitation and Harvest of White Crappie in Poverty Point Reservoir, Louisiana. Proc. Annu. Conf. Southeast. Fish and Wildl. Agencies 65:136 – 142.